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EXAMINER
ROMANO, JOHN J

ART UNIT	PAPER NUMBER
2192	

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/005,923	FLANAGAN ET AL.
	Examiner	Art Unit
	John J. Romano	2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 09 May 2005.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
    closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 04 December 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1.   Applicant's response received May 9th, 2005, responding to the February 10th,

2005, Office action provided in the rejections of claims 1-51.   Claims 1-51 remain

pending in this application and which have been fully considered by the examiner.

Examiner withdraws the objection to the Drawings, corresponding to applicants'

arguments.

Applicant arguing that the rejection does not satisfy any of the criteria of MPEP §

2143 (see pages 10-17 of the response) primarily based on assertions on page 11-12,

where applicant contends that *Jackson* does not teach or suggest "...mapping a

warning into an annotation modification", are not persuasive, as will be addressed

under Prior Art's Arguments – Rejections section at item 2 below. Accordingly,

Applicants' arguments necessitated additional clarifications, in light of the rejection of

the claims over prior art provided in the previous Office action, to further point out that

Jackson discloses as such claimed limitations as argued which will be provided and/or

addressed under the item 2 below. Thus, the rejection of the claims over prior art in the

previous Office action is maintained in light of the necessitated additional clarifications

provided hereon and **THIS ACTION IS MADE FINAL.** Applicant is reminded of the

extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Prior Art's Arguments – Rejections

2.   Applicant's arguments filed May 9th, 2005, in particular on pages 10-17, have

been fully considered but they are not persuasive. For example,

(1) As to Claim 1, Applicant contends that *Jackson* does not teach or suggest

mapping a warning into an annotation modification, (see page 11, first paragraph of the

response), which examiner strongly disagrees. However, while Applicants recognized

that *Jackson* teaches that a programmer or checker program can add lines of aspect

specification to the code, Applicant states that this limitation is in contrast to mapping a

warning into an annotation modification, which Examiner again strongly disagrees.

Applicant, discloses in the Background of the Invention that the presence of the

"*annotations provide a specification of other parts of the program*" (page 3, lines 13-14),

thereby "the annotations guides the checking process" (page 3, lines 8-10). Examiner

points out that the specification aspects added or mapped to the code are the

equivalent to Applicants' warnings mapped into an annotation modification, wherein the

specification aspects provide a specification of other parts of the program and guide the

checking process, thus the specifications aspects are the warnings mapped into an

annotation modification. Thus as taught by Jackson the central concept to his invention

is "aspect", wherein as an example he teaches focusing on an array object type

includes the aspects of its contents, its size and its lower bound, wherein again the

aspect or specification aspects provide a specification of other parts of the program and

guide the checking process as does Applicant's warning annotations. Therefore,

although *Jackson* uses different terminology he is disclosing the same function and thus

the rejection of claim 1 is maintained in respect to specification aspect being interpreted

as an annotation.

Applicant then contends that *Jackson* does not teach or suggest modifying the

computer program in accordance with the at least one annotation modification, (see

page 11, third paragraph of the response), which examiner strongly disagrees.

Applicant states "Jackson merely teaches that a programmer or checker program can

add lines of aspect specification to the code (see col. 5, lines 63-67)", which Examiner

again disagrees as the aspect specification added by the checker program are the

equivalent of warnings mapped into annotation modifications, wherein the computer

program is modified in accordance with the annotation modifications as they are

implemented into the program as shown in Figure 6 (elements 106 and 108). Thus, the

Examiner maintains the rejection of claim 1 in respect to the computer program being

modified in accordance with the annotation modifications.

Applicants state that *Saxe* merely teaches that a section of source code can be

fed back into a verification condition generator. Examiner contends that Saxe discloses

that repeating a verification process via feeding modified source code back into a

verification generator as disclosed in the previous office action. Jackson teaches steps

a), b) and c) as addressed above and in the previous office action. Therefore, each

limitation is disclosed. Therefore, the rejection is maintained.

(2) As per claim 22, Examiner reiterates the arguments presented above in

connection to claim 1, as addressed above and below. Thus, the rejection of claim 22,

and its dependents is maintained.

(3) As to claim 36, the examiner reasserts the arguments presented above in

connection to claim 1, as addressed above and below. Thus, the rejection of claim 36,

and its dependents is maintained.

(4) As to claim 50, the examiner reasserts the arguments presented above in

connection to claim 1, as addressed above and below. Thus, the rejection of claim 50,

is maintained.

(5) As to claim 51, the examiner reasserts the arguments presented above in

connection to claim 1, as addressed above and below. Applicant also states that

Jackson does not teach or suggest producing warnings about inconsistencies between

the computer program and on or more annotations. In regard to the current argument,

the Examiner would like to direct Applicant to Jackson, column 13, lines 32-36, wherein

conjecture messages note discrepancies between the code and the aspect specification

or annotations. Furthermore, in regard to Applicant's statement that Jackson does not

suggest removing from the computer program an annotation that is mentioned by at

least one warning, the Examiner disagrees. Applicant further contends that Examiner

did not point to a location in Jackson that teaches or suggests this recitation, which

Examiner also disagrees. Examiner would like to direct attention to claim 6, which the

previous office action states "In regard to claim 51, the rejections of claims 1, 2, 4 and 6

are incorporated, wherein all claimed limitations have also been addressed and/or cited

as set forth above", wherein claim 6 discloses at least "E.g., see Figure 2 & Column 12,

line 61-Column 13, line 2), wherein when repeating and using heuristically derived

annotations or annotations from a previous pass the user may opt to omit or remove

such modifications upon an error or warning generation. Thus, the rejection of claim 51,

is maintained.

(6) As to claim 9, the examiner reasserts the arguments presented above in

connection to claim 1, as addressed above and below. Thus, the rejection of claim 9 is

maintained.

(7) As to claims 10-13, 29-31 and 43-45, the examiner reasserts the arguments

presented above in connection to claims 1, 22 and 26 as addressed above and below.

Thus, the rejection of claims 10-13, 29-31 and 43-45, are maintained.

Claim Rejections

Claims 1-51, are pending claims, stand finally rejected in light of the additional

clarifications provided and/or addressed at item 2 above, Prior Art's Arguments –

Rejections, as claims 1-8, 14-28, 32-42 and 46-51 are unpatentable over Jackson in

view of Saxe '376. Claim 9 is unpatentable over Jackson in view of Sace '376 and

further in view of Saxe '362. Claims 10-13, 29-31 and 43-45 are unpatentable over

Jackson in view of Saxe '376 and further in view of Haley. The claim rejections from the

previous office action of February 10th, 2005 are included below for completeness.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims **1-8, 14-28, 32-42 and 46-51** are rejected under 35 U.S.C. 103(a) as

being unpatentable over Jackson, US 5,423,027 (hereinafter **Jackson**) in view of Saxe

et al., US 6343,376 (hereinafter **Saxe '376**).

3.   In regard to claim **1**, **Jackson** discloses:

-      *"A method of annotating a computer program ..."* (E.g., see Figure 6 &

         Column 5, lines 62-67), wherein annotation is disclosed.

-      *"... a) applying a program checking tool to the computer program to*

         produce one or more warnings..." (E.g., see Figure 1 & Column 4,

         lines 53-56), wherein the checker program tool is applied to the code

         and produces an approximate specification or a warning.

- *"...b) mapping at least one of said warnings into at least one annotation modification..."* (E.g., see Figure 6 & Column 5, lines 62-67), wherein the checker program adds lines of aspect specifications or annotations to the code where relevant (mapping) as shown in figure 6.

- *"...c) modifying the computer program in accordance with said at least one annotation modification so that the number of annotations in the computer program changes, thereby producing a modified computer program..."* (E.g., see Figure 6 & Column 5, lines 62-67), wherein the code is modified with an annotation, thereby increasing the number of annotations in the program.

But **Jackson** does not expressly disclose "repeating each of steps a, b and c until no warnings produced... are suitable for mapping into an annotation modification" or "providing a user with the modified computer program in which is found at least one annotation". However, **Saxe '376** discloses:

- *"...d) repeating ..."* (E.g., see Figure 2 & Column 7, lines 19-26), wherein edited code may be fed back to a condition generator causing the process to repeat from the beginning.

- *"...e) providing a user with the modified computer program in which is found at least one annotation."* (E.g., see Figure 2 & Column 7, lines 16-18), wherein the display manager provides the user the modified computer program in which is found at least one annotation.

Jackson and Saxe '376 are analogous art because they are both concerned with the same field of endeavor, namely, a condition or specification or warning automatically generated and tested for analyzing computer software. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine Jackson's process of mapping a warning into at least one annotation modification with Saxe's teaching of repeating a process of a verification condition generated, tested and reported to a user. The motivation to do so would have been to assist in elimination of the diagnosed error as suggested by Saxe '376 (E.g., see Column 7, lines 19-27).

4.   In regard to claim 2, the rejections of base claim 1 are incorporated. Furthermore, Jackson discloses:

-    "...wherein at least a subset of said warnings are warnings about potential misapplications of primitive operations in the computer program." (E.g., see Figure 6 & Column 13, lines 25-29), wherein Figure 6 shows the specification to check an array's size, which if out of bounds would be a misapplication of a primitive operation such as an array access error.

5.   In regard to claim 3, the rejections of base claim 2 are incorporated. Furthermore, Jackson discloses:

-    "...prior to said mapping, said warnings about potential misapplications of primitive operations in the computer program are identified, and said modifying comprises inserting into the computer program at least one

annotation that is produced by mapping at least one of said warnings

about potential misapplications of primitive operations into an

annotation modification." (E.g., see Figure 6 & Column 3, line 43-48),

wherein prior to mapping to an error the annotation is mapped to the

code where the location is relevant.

6.   In regard to claim **4**, the rejections of base claim **1** are incorporated.

Furthermore, **Jackson** discloses:

-   *"...prior to said applying, a candidate set of heuristically derived*

    annotations is inserted into the computer program." (E.g., see Figure 2

    & Column 4, lines 53-56), wherein the set of specifications are

    approximate or a candidate set.

7.   In regard to claim **5**, the rejections of base claim **4** are incorporated.

Furthermore, **Jackson** discloses:

-   *"...at least a subset of said warnings are warnings about*

    inconsistencies between the computer program and one or more of the

    annotations." (E.g., see Figure 2 & Column 3, lines 1-11), wherein the

    dependencies or inconsistencies between the computer program and

    one or more of the annotations are compared.

8.   In regard to claim **6**, the rejections of base claim **5** are incorporated.

Furthermore, **Jackson** discloses:

-   *"...said modifying comprises removing from the computer program one*

    of said heuristically derived annotations identified by said at least one

annotation modification." (E.g., see Figure 2 & Column 12, line 61 –

Column 13, line 2), wherein when repeating and using heuristically

derived annotations or annotations from a previous pass the user may

opt to omit or remove such modifications upon an error generation.

9.   In regard to claim **7**, the rejections of base claim **4** are incorporated.

Furthermore, **Saxe '376** discloses:

-   "...*a candidate invariant for a variable f.*" (E.g., see Figure 2 & Column

    2, lines 50-55), wherein the axiom database (220) contains a candidate

    rule or invariant which may be applied to a variable.

Therefore, at the time the invention was made, it would have been obvious to a

person of ordinary skill in the art to combine **Jackson's** process of mapping a warning

into at least one annotation modification with **Saxe's** teaching of candidate rule or

invariant. The motivation to do so would have been to assist in elimination of the

diagnosed error as suggested by **Saxe '376** (E.g., see Column 7, lines 19-27).

10.   In regard to claim **8**, the rejections of base claim **5** are incorporated.

Furthermore, **Saxe '376** discloses:

-   "...*precondition for a procedure in said computer program.*" (E.g., see

    Figure 3 & Column 9, lines 38-45), wherein a precondition is verified

    before compilation of a particular segment of code.

Therefore, at the time the invention was made, it would have been obvious to a

person of ordinary skill in the art to combine **Jackson's** process of mapping a warning

into at least one annotation modification with **Saxes '376** teaching of a precondition.

The motivation to do so would have been to assist in elimination of the diagnosed error

as suggested by **Saxe '76** (E.g., see Column 7, lines 19-27).

11.   In regard to claim **14**, the rejections of base claim **1** are incorporated.

Furthermore, **Jackson** discloses:

- "...*at least one of said warnings includes an explanation.*" (E.g., see

  Figure 11 & Column 13, line 21-36), wherein the messages and errors

  are explanations.

12.   In regard to claim **15**, the rejections of base claim **1** are incorporated.

Furthermore, **Jackson** discloses:

- "...*at least one of said annotations in said modified computer program

  includes an explanation.*" (E.g., see Figure 11 & Column 13, lines 21-

  36), wherein the messages or explanations note discrepancies.

13.   In regard to claim **16**, the rejections of base claim **6** are incorporated.

Furthermore, **Jackson** discloses:

- "...*commenting out one of said heuristically derived annotations from

  the computer program.*" (E.g., see Figure 11 & Column 12, line 61 –

  Column 13, line 2), wherein an intentional omission or commenting out

  is performed.

14.   In regard to claim **17**, the rejections of base claim **16** are incorporated.

Furthermore, **Jackson** discloses:

- "...*adding an explanatory comment into one of said heuristically

  derived annotations from the computer program.*" (E.g., see Figure 11

& Column 13, lines 21-36), wherein the messages or explanations note

discrepancies from the derived annotations, thus adding an

explanatory comment into one of said heuristically derived annotations.

15.   In regard to claim **18**, the rejections of base claim **3** are incorporated.

Furthermore, **Jackson** discloses:

-    "*...annotation includes an explanatory comment.*" (E.g., see Figure 11

    & Column 13, lines 21-36), wherein the messages or explanations note

    discrepancies from the derived annotations, thus adding an

    explanatory comment into one of said heuristically derived annotations.

16.   In regard to claim **19**, the rejections of base claim **1** are incorporated.

Furthermore, **Jackson** discloses:

-    "*...program checking tool is a type checker.*" (E.g., see Figure 11 &

    Column 1, lines 35-44), wherein type checking is disclosed and

    employed.

17.   In regard to claim **20**, the rejections of base claim **1** are incorporated.

Furthermore, **Jackson** discloses:

-    "*...program checking tool is an extended static checker.*" (E.g., see

    Figure 11 & Column 2, lines 28-34), wherein program checking tool is

    more powerful than a type checker or program checking tool is an

    extended static checker.

18.   In regard to claim **21**, the rejections of base claim **1** are incorporated.

Furthermore, **Saxe '376** discloses:

- "...*tool comprises a verification condition generator and a theorem*

     prover." (E.g., see Figure 2 & Column 2, lines 26-29).

Therefore, at the time the invention was made, it would have been obvious to a

person of ordinary skill in the art to combine **Jackson's** process of mapping a warning

into at least one annotation modification with **Saxe's** teaching of a verification condition

generator and a theorem prover. The motivation to do so would have been to assist in

elimination of the diagnosed error as suggested by **Saxe '376** (E.g., see Column 7, lines

19-27).

19.   In regard to claim **22**, **Jackson** discloses:

- "*A computer program product for use in conjunction with a computer*

     system, the computer program product comprising a computer

     readable storage medium and a computer program mechanism

     embedded therein, the computer program mechanism comprising ..."

     (E.g., see Figure 10 & Column 3, lines 49-57).

- "*... a program updater...*" (E.g., see Figure 6 & Column 5, lines 62-67),

     wherein the code is updated with an annotation, thereby increasing the

     number of annotations in the program.

But **Jackson** does not expressly disclose "control instructions for repeatedly

invoking the program checking tool, warning mapper and program updater...".

However, **Saxe '376** discloses:

- "*...control instructions for repeatedly invoking the program checking*

     tool, warning mapper and program updater..." (E.g., see Figure 2 &

Column 7, lines 19-26), wherein edited code may be fed back to a

condition generator causing the process to repeat from the beginning

and wherein control instructions allowing the annotated program to be

fed back into the verification condition generator are inherent.

Jackson and **Saxe '376** are analogous art because they are both concerned

with the same field of endeavor, namely, a condition or specification or warning

automatically generated and tested for analyzing computer software. Therefore, at the

time the invention was made, it would have been obvious to a person of ordinary skill in

the art to combine **Jackson's** process of mapping a warning into at least one

annotation modification with **Saxe's** teaching of control instructions for repeatedly

invoking the program checking tool, warning mapper and program updater. The

motivation to do so would have been to assist in elimination of the diagnosed error as

suggested by **Saxe '376** (E.g., see Column 7, lines 19-27). Thus, it would have been

obvious to implement these commonly used methods into **Jackson's** process.

See rejections of claim **1** for the remaining features of claim **22**.

20.   As per claims **23-28** and **32-35,** this is a program product version of the claimed

method discussed above, in claims **2-7, 17, 19-21** respectively, wherein all claimed

limitations have also been addressed and/or cited as set forth above. For example, see

Jackson (E.g., see Figure 10 & Column 3, lines 49-57). Additionally, all base claims

are incorporated into the rejections as well.

21.   In regard to claim **36**, **Jackson** discloses:

- *"A system for annotating a computer program with at least one*

   annotation; the system comprising: at least one memory, at least one

   processor and at least one user interface, all of which are connected to

   one another by at least one bus..." (E.g., see Figure 10 & Column 3,

   lines 49-57), wherein a computer system for annotating a computer

   program is disclosed.

See rejections of claim **1** and **22** for the remaining features of claim **36**.

22.   As per claims **37-42** and **46-49,** this is a system version of the claimed program

product discussed above, in claims **2-7, 17, 19-21,** respectively, wherein all claimed

limitations have also been addressed and/or cited as set forth above. For example, see

Jackson (E.g., see Figure 10 & Column 3, lines 49-57). Additionally, all base claims

are incorporated into the rejections as well.

23.   In regard to claim **50**, the rejections of claims **1** and **2** are incorporated, wherein

all claimed limitations have also been addressed and/or cited as set forth above.

24.   In regard to claim **51**, the rejections of claims **1 2, 4** and **6** are incorporated,

wherein all claimed limitations have also been addressed and/or cited as set forth

above.

25.   Claim **9** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Jackson**,

in view of **Saxe '376** and further in view of Saxe et al., US 6,553,362 (hereinafter **Saxe**

'362).

26.   In regard to claim **9**, the rejections of base claim **4** are incorporated.

Furthermore, **Saxe '362** discloses:

- "...*postcondition for a procedure in said computer program.*" (E.g., see
  Figure 5 & Column 24, lines 59-64), wherein a postcondition (504) is
  taught.

Saxe '362 and the combined teaching of **Jackson** and **Saxe '376** over

obviousness are analogous art because they are both concerned with the same field of

endeavor, namely, a condition or specification or warning automatically generated and

tested for analyzing computer software. Therefore, at the time the invention was made,

it would have been obvious to a person of ordinary skill in the art to combine **Jackson's**

process of mapping a warning into at least one annotation modification with **Saxe's**

teaching of a postcondition. The motivation to do so would have been to assist in

elimination of the diagnosed error as suggested by **Saxe '376** (E.g., see Column 7, lines

19-27). Additionally, **Jackson** teaches the dependence of the post-state to the pre-

state (Column 13, lines 5-8). Thus, it would have been obvious at the time the invention

was made to implement a post-state condition.

27.   Claims **10-13, 29-31** and **43-45** are rejected under 35 U.S.C. 103(a) as being

unpatentable over **Jackson**, in view of **Saxe '376** and further in view of Haley et al., US

6,154,876 (hereinafter **Haley**).

28.   In regard to claim **10**, the rejections of base claim **7** are incorporated.

Furthermore, **Haley** discloses:

- "...*the form f!=null.*" (E.g., see Figure 5 & Column 14, lines 45-48),

  wherein not equal to null is taught.

Haley and the combined teaching of **Jackson** and **Saxe '376** over obviousness

are analogous art because they are both concerned with the same field of endeavor,

namely, a detection of programming errors in a computer program through analysis.

Therefore, at the time the invention was made, it would have been obvious to a person

of ordinary skill in the art to combine **Jackson's** process of mapping a warning into at

least one annotation modification with **Haley's** teaching of an invariant not being equal

to null. The motivation to do so would have been to assist in elimination of the

diagnosed error as suggested by **Saxe '376** (E.g., see Column 7, lines 19-27).

Furthermore, Haley teaches that the comparison to null will determine the success of an

allocation (Column 2, lines 46-47). Thus, it would have been obvious at the time the

invention was made to implement a not equal to null invariant.

29.   In regard to claim **11**, the rejections of base claim **7** are incorporated.

Furthermore, **Haley** discloses:

- "...*an expression that includes a comparison operator.*" (E.g., see

  Figure 36 & Column 52, lines 45-53), wherein the relational operator is

  a comparison operator.

Therefore, at the time the invention was made, it would have been obvious to a

person of ordinary skill in the art to combine **Jackson's** process of mapping a warning

into at least one annotation modification with **Haley's** teaching of comparison operator.

The motivation to do so would have been to assist in elimination of the diagnosed error

as suggested by **Saxe '376** (E.g., see Column 7, lines 19-27).

30.   In regard to claim **12**, the rejections of base claim **11** are incorporated.

Furthermore, **Haley** discloses:

> - "...*comparison operator is selected from the group consisting of: <, <=,*
>
>   *=, !=, >= and >.*" (E.g., see Figure 36 & Column 52, lines 45-53),
>
>   wherein the relational operator is a comparison operator and the <, <=,
>
>   =, !=, >= and = operators specifically constitute a group.

31.   In regard to claim **13**, the rejections of base claim **11** are incorporated.

Furthermore, **Haley** discloses:

> - "...*wherein said expression includes an operand selected from the*
>
>   *group consisting of: a variable declared earlier in a same class of the*
>
>   *computer program; any one of the constants -1, 0, 1 ...*" (E.g., see
>
>   Figure 30 & Column 59, lines 15-39), wherein −1 or 0 are indicated.
>
> - "...*and a constant dimension in an array allocation expression in the*
>
>   *computer program.*" (E.g., see Figure 8 & Column 46, lines 40-56,
>
>   where a variable and constant array reference is taught.

But Haley does not expressly disclose "said expression includes an operand

selected from the group consisting of: a variable declared earlier in a same class of the

computer program; any one of the constants -1, 0, 1; and a constant dimension in an

array allocation expression in the computer program". It would have been obvious at

the time the invention was made, to one of ordinary skill in the art, to include a group

consisting of "a variable declared earlier in a same class of the computer program; any one of the constants -1, 0, 1; and a constant dimension in an array allocation expression in the computer program" to include in the expression. It is common knowledge in software programming to include a group that pertains to the subject at hand and represent the logical choices. In order to constrain a list of choices to avoid errors by a user, a programmer will include the logical choices and present them to the user for application. Thus, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to implement the logical choices in a group to include in the expression.

32.   As per claims **29-31** this is a program product version of the claimed method discussed above, in claims **11-13** respectively, wherein all claimed limitations have also been addressed and/or cited as set forth above. For example, see **Jackson** (E.g., see Figure 10 & Column 3, lines 49-57). Additionally, all base claims are incorporated into the rejections as well.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J Romano whose telephone number is (571) 272-3872. The examiner can normally be reached on 8-5:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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JJR

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PRIMARY EXAMINER